WHAT IS CLAIMED IS:

1. A method, comprising:

receiving at least one data set for each of a plurality of interconnected stages, each data set corresponding to an option at the corresponding stage, each data set including a first cost and a second cost; and

determining, based upon said at least one data set, an optimum series of options over a series of said stages by selecting a single option at each stage in said series of said stages that minimizes the sum of total costs over said series of said stages, wherein said total costs is a function of said at least one data set.

2. The method of claim 1, further comprising:

transforming said series of said stages into a subgraph of numbered nodes from 1 to N such that each node corresponds to a stage and each node, except a last node N, has only one adjacent node to it that has a higher node number, said one adjacent node having said higher node number being a parent node.

3. The method of claim 2, further comprising:

proceeding in sequential order from node i = 1 to node i = N-1, when the corresponding parent node for node i is downstream thereof:

a) determining the summation of said total costs contributed by node i as a function of first state variables to define first node i costs, said first state variables being a function of said first cost and said second cost over said nodes;

b) minimizing the summation of said total costs for the remainder of the nodes that are upstream of node i as a function of said first state variables to define first upstream node i costs;

c) minimizing the summation of total costs of the nodes that are downstream and adjacent of node i as a function of said first state variables to define first downstream node i costs ;

d) summing the first node i costs, first upstream node i costs, and first downstream node i costs to define first minimum total costs for the subgraph rooted at node i;

e) minimizing the first minimum total costs for the subgraph rooted at node i over each said option and over a first parameter, said first parameter being one of said first state variables.

4. The method of claim 3, further comprising:

when the corresponding parent node for node i is upstream of node i:

a) determining the summation said total costs contributed by node i as a function of a plurality of second state variables to define second node i costs, said second state variables being a function of said first state variables;

b) minimizing the summation of said total costs for the remainder of the system that is upstream of node i as a function of said plurality of second state variables to define second upstream node i costs;

c) minimizing the summation of said total costs for the nodes that are downstream and adjacent of node i as a function of said plurality of second state variable to define second downstream node i costs;

d) summing the second node i costs, second upstream node i costs, and second downstream node i costs to define a second minimum total costs for the subgraph rooted at node i;

e) minimizing the second minimum total costs for the subgraph rooted at node I over each said option and over a second parameter, said second parameter being one of said second state variables.

5. The method of claim 4, further comprising:

for the last node, at node i=N:

a) determining the summation of said total costs contributed by node N as a function of said plurality of second state variables to define node N costs;

b) minimizing the summation of said total costs for the remainder of the nodes that are upstream of node N to define upstream node N costs;

c) minimizing the summation of said total costs for the nodes that are downstream and adjacent of node N as a function of said plurality of second state variables to define downstream node N costs;

d) summing the node N costs, upstream node N costs, and downstream node N costs to define third minimum total costs for the subgraph rooted at node N;

e) minimizing the third minimum total costs for the subgraph rooted at node N over each said option and over said second parameter.

6. The method of claim 5, further comprising:

selecting the option at each node that minimizes the sum of said total costs for the subgraph rooted at each node over said nodes.

7. The method of claim 5, wherein said plurality of first state variables includes a cumulative first cost at a given node, said cumulative first cost being the sum of said first costs of the preceding nodes of at least one

option plus the first cost at the given node associated with a corresponding option.

8. The method of claim 7, wherein said plurality of first state variables includes an incoming service second cost at a given node, said incoming service second cost being the second cost of an option that a preceding node quotes fulfillment to the given node.

9. The method of claim 8, wherein said plurality of first state variables includes a maximum second cost at node i, the maximum second cost at node i being the maximum said second cost of said nodes that directly feed into a given node plus said second cost associated with a corresponding option.

10. The method of claim 9, wherein said plurality of first state variables includes an outgoing service second cost, said outgoing service second cost being the second cost of an option that a given node quotes fulfillment to a successive node.

11. The method of claim 8, wherein said first parameter is said incoming service second cost.

12. The method of claim 11, wherein said plurality of said second state variables include said first state variables having added to each thereto a corresponding said first cost and said second cost of a corresponding option.

13. The method of claim 12, wherein said second parameter is said outgoing service second cost.

14. The method of claim 1, wherein

said interconnected stages is a supply chain;

each of said plurality of stages represents an operation to be performed;

said first cost is a monetary amount associated with performing said operation; and

said second cost is an amount of time associated with performing said operation.

15. The method of claim 14, wherein said total costs include manufacturing costs of a given stage.

16. The method of claim 15, wherein said manufacturing costs at each stage is the product of an average demand for a product at a given stage and the monetary amount associated with each option.

17. The method of claim 14, wherein said total costs include inventory costs at a given stage.

18. The method of claim 17, said inventory costs include a safety-stock cost, said safety-stock cost being a cost associated with holding stock at a stage to protect against variability.

19. The method of claim 18, wherein said variability is variability of demand at the stage.

20. The method of claim 19, wherein said variability of demand is based on a forecast.

21. The method of claim 18, wherein said safety-stock cost at each stage is the product of an expected safety-stock cost at each stage, a holding

cost rate, and a cumulative cost, said cumulative cost being the sum of said monetary amounts of the preceding stages plus the monetary amount at a stage associated with a corresponding option.

22. The method of claim 21, wherein said expected safety-stock at each stage is a maximum demand at each stage over an interval of time minus an average demand over said interval of time.

23. The method of claim 17, said inventory costs include a pipeline stock cost for each stage, the pipeline stock cost being a cost associated with stock undergoing said operation by the stage but not yet completed.

24. The method of claim 23, wherein the pipeline stock cost at each stage is a function of an expected pipeline stock at each stage multiplied by the average cost of the product at a given stage.

25. The method of claim 24, wherein the expected pipeline stock at each stage is the product of an average demand and said amount of time associated with a corresponding option.

26. The method of claim 14, wherein said total costs include a time-to-market cost at each stage.

27. The method of claim 26, wherein said time-to-market cost at each stage is the product of a weighted cost and a longest time path up to and including said amount of time associated with an option at the given stage.

28. The method of claim 14, said monetary amount includes at least one of a direct material cost and a direct labor cost associated with performing said function at said stage.

29. The method of claim 14, said amount of time includes at least one of a processing time required to put an item in inventory and a transportation time.

30. The method of claim 1, said first cost is a monetary amount associated with an option at a stage.

31. The method of claim 1, wherein said second cost is an amount of time associated with an option at a stage.

32. The method of claim 1, wherein each of said plurality of stages represents an operation to be performed.

33. A method of claim 1, wherein said interconnected stages is a production system.

34. A method of claim 33, wherein said production system is a supply chain.

35. A method of claim 1, wherein said series of said stages includes at least one of said plurality of stages.

36. A method of claim 35, wherein said at least one of said plurality of said stages includes all of said stages.

37. A method of claim 1, wherein said total costs is the summation of quantifiable characteristics, said summation of quantifiable characteristics being a function of said data sets.

38. A method of claim 37, wherein said summation of quantifiable characteristics includes at least one of a manufacturing cost, inventory cost, and time-to-market cost.

39. A method of claim 1, wherein said at least one data set includes a plurality of data sets.

40. A computer-readable medium encoded with a program for a computer, the program comprising:

receiving at least one data set for each of a plurality of interconnected stages, each data set corresponding to an option at the corresponding stage, each data set including a first cost and a second cost; and

determining, based upon said at least one data set, an optimum series of options over a series of said stages by selecting a single option at each stage in said series of said stages that minimizes the sum of total costs over said series of said stages, wherein said total costs is a function of said at least one data set.

41. The computer-readable medium of claim 40, further comprising:

transforming said series of said stages into a subgraph of numbered nodes from 1 to N such that each node corresponds to a stage and each node, except a last node N, has only one adjacent node to it that has a higher node number, said one adjacent node having said higher node number being a parent node.

42. The computer-readable medium of claim 41, further comprising:

proceeding in sequential order from node i = 1 to node i = N-1,

when the corresponding parent node for node i is downstream thereof:

a) determining the summation of said total costs contributed by node i as a function of first state variables to define first node i costs, said first state variables being a function of said first cost and said second cost over said nodes;

b) minimizing the summation of said total costs for the remainder of the system that is upstream of node i as a function of said first state variables to define first upstream node i costs;

c) minimizing the summation of total costs of the nodes that are downstream and adjacent of node i as a function of said first state variables to define first downstream node i costs ;

d) summing the first node i costs, first upstream node i costs, and first downstream node i costs to define first minimum total costs for the subgraph rooted at node i;

e) minimizing the first minimum total costs for the subgraph rooted at node i over each said option and over a first parameter, said first parameter being one of said first state variables.

43. The computer-readable medium of claim 42, further comprising:

when the corresponding parent node for node i is upstream of node i:

a) determining the summation said total costs contributed by node i as a function of a plurality of second state variables to define second node i costs, said second state variables being a function of said first state variables;

b) minimizing the summation of said total costs for the remainder of the system that is upstream of node i as a function of

said plurality of second state variables to define second upstream node i costs;

c) minimizing the summation of said total costs for the nodes that are downstream and adjacent of node i as a function of said plurality of second state variable to define second downstream node i costs;

d) summing the second node i costs, second upstream node i costs, and second downstream node i costs to define a second minimum total costs for the subgraph rooted at node i;

e) minimizing the second minimum total costs for the subgraph rooted at node I over each said option and over a second parameter, said second parameter being one of said second state variables.

44. The computer-readable medium of claim 43, further comprising:

for the last node, at node i=N:

a) determining the summation of said total costs contributed by node N as a function of said plurality of second state variables to define node N costs;

b) minimizing the summation of said total costs for the remainder of the system that is upstream of node N to define upstream node N costs;

c) minimizing the summation of said total costs for the nodes that are downstream and adjacent of node N as a function of said plurality of second state variables to define downstream node N costs;

d) summing the node N costs, upstream node N costs, and downstream node N costs to define third minimum total costs for the subgraph rooted at node N;

e) minimizing the third minimum total costs for the subgraph rooted at node N over each said option and over said second parameter.

45. The computer-readable medium of claim 44, further comprising:

selecting the option at each node that minimizes the sum of said total costs for the subgraph rooted at each node over said nodes.

46. The computer-readable medium of claim 44, wherein said plurality of first state variables includes a cumulative first cost at a given node, said cumulative first cost being the sum of said first costs of the preceding nodes of at least one option plus the first cost at the given node associated with a corresponding option.

47. The computer-readable medium of claim 46, wherein said plurality of first state variables includes an incoming service second cost at a given node, said incoming service second cost being the second cost of an option that a preceding node quotes fulfillment to the given node.

48. The computer-readable medium of claim 47, wherein said plurality of first state variables includes a maximum second cost at node i, the maximum second cost at node i being the maximum said second cost of said nodes that directly feed into a given node plus said second cost associated with a corresponding option.

49. The computer-readable medium of claim 48, wherein said plurality of first state variables includes an outgoing service second cost, said outgoing service second cost being the second cost of an option that a given node quotes fulfillment to a successive node.

50. The computer-readable medium of claim 47, wherein said first parameter is said incoming service second cost.

51. The computer-readable medium of claim 50, wherein said plurality of said second state variables include said first state variables having added to each thereto a corresponding said first cost and said second cost of a corresponding option.

52. The computer-readable medium of claim 51, wherein said second parameter is said outgoing service second cost.

53. The computer-readable medium of claim 40, wherein

said interconnected stages is a supply chain;

each of said plurality of stages represents an operation to be performed;

said first cost is a monetary amount associated with performing said operation; and

said second cost is an amount of time associated with performing said operation.

54. The computer-readable medium of claim 53, wherein said total costs include manufacturing costs of a given stage.

55. The computer-readable medium of claim 54, wherein said manufacturing costs at each stage is the product of an average demand for a product at a given stage and the monetary amount associated with each option.

56. The computer-readable medium of claim 53, wherein said total costs include inventory costs at a given stage.

57. The computer-readable medium of claim 56, said inventory costs include a safety-stock cost, said safety-stock cost being a cost associated with holding stock at a stage to protect against variability.

58. The computer-readable medium of claim 57, wherein said variability is variability of demand at the stage.

59. The computer-readable medium of claim 58, wherein said variability of demand is based on a forecast.

60. The computer-readable medium of claim 57, wherein said safety-stock cost at each stage is the product of an expected safety-stock cost at each stage, a holding cost rate, and a cumulative cost, said cumulative cost being the sum of said monetary amounts of the preceding stages plus the monetary amount at a stage associated with a corresponding option.

61. The computer-readable medium of claim 60, wherein said expected safety-stock at each stage is a maximum demand at each stage over an interval of time minus an average demand over said interval of time.

62. The computer-readable medium of claim 56, said inventory costs include a pipeline stock cost for each stage, the pipeline stock cost being a cost associated with stock undergoing said operation by the stage but not yet completed.

63. The method of claim 62, wherein the pipeline stock cost at each stage is a function of an expected pipeline stock at each stage multiplied by the average cost of the product at a given stage.

64. The computer-readable medium of claim 63, wherein the expected pipeline stock at each stage is the product of an average demand and said amount of time associated with a corresponding option.

65. The computer-readable medium of claim 53, wherein said total costs include a time-to-market cost at each stage.

66. The computer-readable medium of claim 65, wherein said time-to-market cost at each stage is the product of a weighted cost and a longest time path up to and including said amount of time associated with an option at the given stage.

67. The computer-readable medium of claim 53, said monetary amount includes at least one of a direct material cost and a direct labor cost associated with performing said function at said stage.

68. The computer-readable medium of claim 53, said amount of time includes at least one of a processing time required to put an item in inventory and a transportation time.

69. The computer-readable medium of claim 40, said first cost is a monetary amount associated with an option at a stage.

70. The computer-readable medium of claim 40, wherein said second cost is an amount of time associated with an option at a stage.

71. The computer-readable medium of claim 40, wherein each of said plurality of stages represents an operation to be performed.

72. The computer-readable medium of claim 40, wherein said interconnected stages is a production system.

73. The computer-readable medium of claim 72, wherein said production system is a supply chain.

74. The computer-readable medium of claim 40, wherein said series of said stages includes at least one of said plurality of stages.

75. The computer-readable medium of claim 74, wherein said at least one of said plurality of said stages includes all of said stages.

76. The computer-readable medium of claim 40, wherein said total costs is the summation of quantifiable characteristics, said summation of quantifiable characteristics being a function of said data sets.

77. The computer-readable medium of claim 76, wherein said summation of quantifiable characteristics includes at least one of a manufacturing cost, inventory cost, and time-to-market cost.

78. The computer-readable medium of claim 40, wherein said at least one data set includes a plurality of data sets.

79. An apparatus, comprising:

a first computer including a receiving portion and a processing portion, said receiving portion configured to receive at least one data set for each of a plurality of interconnected stages, each data set corresponding to an

option at the corresponding stage, each data set including a first cost and a second cost; and

said processing portion is configured to determine, based upon said at least one data set, an optimum series of options over a series of said stages by selecting a single option at each stage in said series of said stages that minimizes the sum of total costs over said series of said stages, wherein said total costs is a function of said at least one data set.

80. The apparatus of claim 79, further includes:

the processing portion being configured to transform said series of said stages into a subgraph of numbered nodes from 1 to N such that each node corresponds to a stage and each node, except a last node N, has only one adjacent node to it that has a higher node number, said one adjacent node having said higher node number being a parent node.

81. The apparatus of claim 80, further includes:

the processing portion being configured to proceed in sequential order from node i = 1 to node i = N-1,

when the corresponding parent node for node i is downstream thereof, the processing portion is configured to:

a) determine the summation of said total costs contributed by node i as a function of first state variables to define first node i costs, said first state variables being a function of said first cost and said second cost over said nodes;

b) minimize the summation of said total costs for the remainder of the system that is upstream of node i as a function of said first state variables to define first upstream node i costs;

c) minimize the summation of total costs of the nodes that are downstream and adjacent of node i as a function of said first state variables to define first downstream node i costs ;

d) sum the first node i costs, first upstream node i costs, and first downstream node i costs to define first minimum total costs for the subgraph rooted at node i;

e) minimize the first minimum total costs for the subgraph rooted at node i over each said option and over a first parameter, said first parameter being one of said first state variables.

82. The apparatus of claim 81, further including:

when the corresponding parent node for node i is upstream of node i, the processing portion is configured to:

a) determine the summation said total costs contributed by node i as a function of a plurality of second state variables to define second node i costs, said second state variables being a function of said first state variables;

b) minimize the summation of said total costs for the remainder of the system that is upstream of node i as a function of said plurality of second state variables to define second upstream node i costs;

c) minimize the summation of said total costs for the nodes that are downstream and adjacent of node i as a function of said plurality of second state variable to define second downstream node i costs;

d) sum the second node i costs, second upstream node i costs, and second downstream node i costs to define a second minimum total costs for the subgraph rooted at node i;

e) minimize the second minimum total costs for the subgraph rooted at node i over each said option and over a second parameter, said second parameter being one of said second state variables.

83. The apparatus of claim 82, further including:

for the last node, at node i=N, the processing portion is configured to:

a) determine the summation of said total costs contributed by node N as a function of said plurality of second state variables to define node N costs;

b) minimize the summation of said total costs for the remainder of the system that is upstream of node N to define upstream node N costs;

c) minimize the summation of said total costs for the nodes that are downstream and adjacent of node N as a function of said plurality of second state variables to define downstream node N costs;

d) sum the node N costs, upstream node N costs, and downstream node N costs to define third minimum total costs for the subgraph rooted at node N;

e) minimize the third minimum total costs for the subgraph rooted at node N over each said option and over said second parameter.

84. The apparatus of claim 83, further including:

the processing portion being configured to select the option at each node that minimizes the sum of said total costs for the subgraph rooted at each node over said nodes.

85. The apparatus of claim 83, wherein said plurality of first state variables includes a cumulative first cost at a given node, said cumulative first cost being the sum of said first costs of the preceding nodes of at least one option plus the first cost at the given node associated with a corresponding option.

86. The apparatus of claim 85, wherein said plurality of first state variables includes an incoming service second cost at a given node, said incoming service second cost being the second cost of an option that a preceding node quotes fulfillment to the given node.

87. The apparatus of claim 86, wherein said plurality of first state variables includes a maximum second cost at node i, the maximum second cost at node i being the maximum said second cost of said nodes that directly feed into a given node plus said second cost associated with a corresponding option.

88. The apparatus of claim 87, wherein said plurality of first state variables includes an outgoing service second cost, said outgoing service second cost being the second cost of an option that a given node quotes fulfillment to a successive node.

89. The method of claim 86, wherein said first parameter is said incoming service second cost.

90. The method of claim 89, wherein said plurality of said second state variables include said first state variables having added to each thereto a corresponding said first cost and said second cost of a corresponding option.

91. The method of claim 90, wherein said second parameter is said outgoing service second cost.

92. The apparatus of claim 79, wherein
said interconnected stages is a supply chain;

each of said plurality of stages represents an operation to be performed;

said first cost is a monetary amount associated with performing said operation; and

said second cost is an amount of time associated with performing said operation.

93. The apparatus of claim 92, wherein said total costs include manufacturing costs of a given stage.

94. The apparatus of claim 93, wherein said manufacturing costs at each stage is the product of an average demand for a product at a given stage and the monetary amount associated with each option.

95. The apparatus of claim 92, wherein said total costs include inventory costs at a given stage.

96. The apparatus of claim 95, said inventory costs include a safety-stock cost, said safety-stock cost being a cost associated with holding stock at a stage to protect against variability.

97. The apparatus of claim 96, wherein said variability is variability of demand at the stage.

98. The apparatus of claim 97, wherein said variability of demand is based on a forecast.

99. The apparatus of claim 96, wherein said safety-stock cost at each stage is the product of an expected safety-stock cost at each stage, a holding cost rate, and a cumulative cost, said cumulative cost being the sum of

said monetary amounts of the preceding stages plus the monetary amount at a stage associated with a corresponding option.

100. The apparatus of claim 99, wherein said expected safety-stock at each stage is a maximum demand at each stage over an interval of time minus an average demand over said interval of time.

101. The apparatus of claim 95, said inventory costs include a pipeline stock cost for each stage, the pipeline stock cost being a cost associated with stock undergoing said operation by the stage but not yet completed.

102. The apparatus of claim 101, wherein the pipeline stock cost at each stage is a function of an expected pipeline stock at each stage multiplied by the average cost of the product at a given stage.

103. The apparatus of claim 102, wherein the expected pipeline stock at each stage is the product of an average demand and said amount of time associated with a corresponding option.

104. The apparatus of claim 92, wherein said total costs include a time-to-market cost at each stage.

105. The apparatus of claim 104, wherein said time-to-market cost at each stage is the product of a weighted cost and a longest time path up to and including said amount of time associated with an option at the given stage.

106. The apparatus of claim 92, said monetary amount includes at least one of a direct material cost and a direct labor cost associated with performing said function at said stage.

107. The apparatus of claim 92, said amount of time includes at least one of a processing time required to put an item in inventory and a transportation time.

108. The apparatus of claim 79, said first cost is a monetary amount associated with an option at a stage.

109. The apparatus of claim 79, wherein said second cost is an amount of time associated with an option at a stage.

110. The apparatus of claim 79, wherein each of said plurality of stages represents an operation to be performed.

111. The apparatus of claim 79, wherein said interconnected stages is a production system.

112. The apparatus of claim 111, wherein said production system is a supply chain.

113. The apparatus of claim 79, wherein said series of said stages includes at least one of said plurality of stages.

114. The apparatus of claim 113, wherein said at least one of said plurality of said stages includes all of said stages.

115. The apparatus of claim 79, wherein said total costs is the summation of quantifiable characteristics, said summation of quantifiable characteristics being a function of said data sets.

116. The apparatus of claim 115, wherein said summation of quantifiable characteristics includes at least one of a manufacturing cost, inventory cost, and time-to-market cost.

117. The apparatus of claim 79, wherein said at least one data set includes a plurality of data sets.

118. A method, comprising:

representing, via a user interface of a given computer, each stage of a network of interconnected stages using a stage symbol;

interconnecting the stage symbols with links to form a representation of the network of interconnected stages, said links being displayed on a display device, wherein each stage symbol is connected to at least one other stage symbol by at least one link; and

determining, based upon information associated with a plurality of options at each of said stages, an optimum series of options over a series of said stages by selecting a single option at each stage in said series of said stages that minimizes the sum of total costs over said series of said stages, wherein said total costs is a function of said information.

119. The method of claim 118, further comprising:

obtaining said information associated with each option of a corresponding stage.

120. The method of claim 119, wherein said information for each option includes at least a first cost and a second cost.

121. The method of claim 120, wherein said information further includes first data.

122. The method of claim 119, further comprising displaying, via the user interface, said information of at least one of said stages.

123. The method of claim 119, wherein obtaining information includes retrieving said information from a database.

124. The method of claim 123, wherein said information is formatted in accordance with Extensible Markup Language (XML) in said database.

125. The method of claim 123, wherein said database is stored in a memory of said given computer.

126. The method of claim 119, wherein said obtaining information further includes accepting said information from a data entry device in conjunction with said user interface.

127. The method of claim 123, wherein the method further comprises maintaining, using said database, one or more chain versions for each said network of interconnected stages.

128. The method of claim 127, wherein the method further comprises controlling user access to each said chain version according to a level of access associated with each of one or more users.

129. The method of claim 127, wherein the method further comprises displaying, via the user interface, a chain status for each said chain version indicating whether or not the chain version is available for editing.

130. The method of claim 123, wherein said database is stored in a second memory of a second computer, and wherein retrieving said information includes:

transmitting, through a network, said information from said second computer to said first computer.

131. The method of claim 130, wherein said network includes at least one of a public switched telephone network, an Internet, and an Intranet.

132. The method of claim 130, wherein said information of said database is accessible by a second user.

133. The method of claim 132, wherein said second user is affiliated with at least one stage of the system.

134. The method of claim 133, wherein said accessible information is readable by said second user.

135. The method of claim 134, wherein said accessible information is modifiable by said second user, and when modified defines modified information, the accessibility of said information being determined by said first data.

136. The method of claim 134, wherein only said information associated with said at least one stage is modifiable by said second user.

137. The method of claim 136, wherein only at least one of said first cost, said second cost, and said third information of a corresponding option is modifiable by said second user.

138. The method of claim 136, wherein obtaining information further includes:

transmitting, through said network, said modified information from said second computer to said first computer; and

replacing, in said database, said information associated with a stage with said modified information.

139. The method of claim 120, wherein said interconnected stages is a supply chain; each of said plurality of stages represents an operation to be performed; said first cost is a monetary amount associated with performing said operation; and said second cost is an amount of time associated with performing said operation.

140. The method of claim 139, wherein said total cost includes at least one of a manufacturing cost, an inventory cost, and a time-to-market cost.

141. The method of claim 140, further comprising:

displaying, via the user interface, a portion of said optimum series of options.

142. The method of claim 141, wherein a portion of said optimum series of options includes at least one of a total of said manufacturing cost, said inventory cost, and said time-to-market cost for a user selected stage of the system.

143. The method of claim 118, wherein said series of said stages includes at least one user selected stage of the system, wherein said user selects, via the user interface, at least one specific stage to be included in the system when determining said optimum series of options.

144. The method of claim 118, wherein said series of said stages includes all stages of the system.

145. The method of claim 118, wherein said optimal series of options includes a user selected option at a corresponding stage, said user selected option being selected by the user via the user interface.

146. The method of claim 141, wherein displaying results includes:

generating, upon a user request, a comparison report showing said total costs for all stages for said optimum series of options and total costs for another series of options, said another series of options including a user selected option at a corresponding stage, said user selected option being selected by the user via the user interface.

147. The method of claim 120, further including:

inputting, via the user interface, a range for at least one of said first cost and said second cost for at least one of said options, and

displaying the totals costs for said optimum series of options as a function of said range, said displaying includes at least one of a tabular format and a graphical format.

148. The method of claim 120, further including:

calculating, upon user request, financial metrics for said optimum series of options for said interconnected system;

calculating, upon user request, said financial metrics for at least one other series of options for said interconnected system; and

displaying, via the user interface, the financial metrics for said optimum series of options and said at least one other series of options in the

form of a profit/loss comparison report, said displaying including at least a tabular format.

149. The method of claim 139, further including:

displaying, upon user request, a cost breakout report showing said inventory cost and said manufacturing cost for a portion of said optimum series of options, said portion corresponding to one or more of said stages selected by the user via the user interface, said displaying including at least a tabular format.

150. The method of claim 139, further including:

displaying, upon user request, an inventory report showing an inventory level associated with said optimum series of options, said displaying including at least a tabular format.

151. The method of claim 150, further including:

displaying, upon user request, an inventory by cause report showing for each said inventory level detailed analysis information, said detailed analysis information including at least one of batching, early arrivals, demand uncertainty, and stage time uncertainty, said displaying including at least a tabular format.

152. The method of claim 120, further including:

displaying, upon user request, said information selected and presented in a user specified arrangement in the form of an ad hoc report, said arrangement selected by the user via the user interface, said displaying including at least a tabular format.

153. The method of claim 120, wherein said cost is a monetary cost associated with an option.

154. The method of claim 120, wherein said time is an amount of time associated with an option.

155. The method of claim 118, wherein each of said plurality of stages represents an operation to be performed.

156. The method of claim 118, wherein said total costs is the summation of quantifiable characteristics, said summation of quantifiable characteristics being a function of said information.

157. The method of claim 156, wherein said summation of quantifiable characteristics includes at least one of a manufacturing cost, inventory cost, and time-to-market cost.

158. The method of claim 118, wherein said stage symbol include at least one of a first shape and a second shape, each of said shapes signifying at least one specific function to be performed at said stage.

159. The method of claim 158, wherein said at least one of said first and said second shapes is colored by at least one of a user defined color and a default color.

160. The method of claim 158, wherein said stage symbol includes at least one user defined icon.

161. The method of claim 160, wherein said at least one user defined icon is user selected, via the user interface, from among a plurality of existent icons.

162. The method of claim 118, wherein said user interface is presented by a web browser.

163. The method of claim 118, wherein at least one of said stages is user defined based upon commands of said user.

164. The method of claim 163, wherein said representing further includes:

positioning, using said user interface, each of said stage symbols within a chain modeling space.

165. A computer-readable medium encoded with a program for a computer, the program comprising:

representing, via a user interface of a given computer, each stage of a network of interconnected stages using a stage symbol;

interconnecting the stage symbols with links to form a representation of the network of interconnected stages, said links being displayed on a display device, wherein each stage symbol is connected to at least one other stage symbol by at least one link; and

determining, based upon information associated with a plurality of options at each of said stages, an optimum series of options over a series of said stages by selecting a single option at each stage in said series of said stages that minimizes the sum of total costs over said series of said stages, wherein said total costs is a function of said information.

166. The computer-readable medium of claim 165, further comprising:

obtaining said information associated with each option of a corresponding stage.

167. The computer-readable medium of claim 166, wherein said information for each option includes at least a first cost and a second cost.

168. The computer-readable medium of claim 167, wherein said information further includes first data.

169. The computer-readable medium of claim 166, further comprising displaying, via the user interface, said information of at least one of said stages.

170. The computer-readable medium of claim 166, wherein obtaining information includes retrieving said information from a database.

171. The computer-readable medium of claim 170, wherein said information is formatted in accordance with Extensible Markup Language (XML) in said database.

172. The computer-readable medium of claim 170, wherein said database is stored in a memory of said given computer.

173. The computer-readable medium of claim 166, wherein said obtaining information further includes accepting said information from a data entry device in conjunction with said user interface.

174. The computer-readable medium of claim 170, further comprising: maintaining, using said database, one or more chain versions for each said network of interconnected stages.

175. The computer-readable medium of claim 174, further comprising controlling user access to each said chain version according to a level of access associated with each of one or more users.

176. The computer-readable medium of claim 174, further comprising displaying, via the user interface, a chain status for each said chain version indicating whether or not the chain version is available for editing.

177. The computer-readable medium of claim 170, wherein said database is stored in a second memory of a second computer, and wherein retrieving said information includes:

transmitting, through a network, said information from said second computer to said first computer.

178. The computer-readable medium of claim 177, wherein said network includes at least one of a public switched telephone network, an Internet, and an Intranet.

179. The computer-readable medium of claim 177, wherein said information of said database is accessible by a second user.

180. The computer-readable medium of claim 179, wherein said second user is affiliated with at least one stage of the system.

181. The computer-readable medium of claim 180, wherein said accessible information is readable by said second user.

182. The computer-readable medium of claim 181, wherein said accessible information is modifiable by said second user, and when modified

defines modified information, the accessibility of said information being determined by said first data.

183. The computer-readable medium of claim 181, wherein only said information associated with said at least one stage is modifiable by said second user.

184. The computer-readable medium of claim 183, wherein only at least one of said first cost, said second cost, and said first data of a corresponding option is modifiable by said second user.

185. The computer-readable medium of claim 183, wherein obtaining information further includes:

transmitting, through said network, said modified information from said second computer to said first computer; and

replacing, in said database, said information associated with a stage with said modified information.

186. The computer-readable medium of claim 167, wherein said interconnected stages is a supply chain; each of said plurality of stages represents an operation to be performed; said first cost is a monetary amount associated with performing said operation; and said second cost is an amount of time associated with performing said operation.

187. The computer-readable medium of claim 186, wherein said total cost includes at least one of a manufacturing cost, an inventory cost, and a time-to-market cost.

188. The computer-readable medium of claim 187, further comprising:

displaying, via the user interface, a portion of said optimum series of options.

189. The computer-readable medium of claim 188, wherein a portion of said optimum series of options includes at least one of a total of said manufacturing cost, said inventory cost, and said time-to-market cost for a user selected stage of the system.

190. The computer-readable medium of claim 165, wherein said series of said stages includes at least one user selected stage of the system, wherein said user selects, via the user interface, at least one specific stage to be included in the system when determining said optimum series of options.

191. The computer-readable medium of claim 165, wherein said series of said stages includes all stages of the system.

192. The computer-readable medium of claim 165, wherein said optimal series of options includes a user selected option at a corresponding stage, said user selected option being selected by the user via the user interface.

193. The computer-readable medium of claim 188, wherein displaying results includes:

generating, upon a user request, a comparison report showing said total costs for all stages for said optimum series of options and total costs for another series of options, said another series of options including a user

selected option at a corresponding stage, said user selected option being selected by the user via the user interface.

194. The computer-readable medium of claim 167, further including:

inputting, via the user interface, a range for at least one of said first cost and said second cost for at least one of said options, and

displaying the totals costs for said optimum series of options as a function of said range, said displaying includes at least one of a tabular format and a graphical format.

195. The computer-readable medium of claim 167, further including:

calculating, upon user request, financial metrics for said optimum series of options for said interconnected system;

calculating, upon user request, said financial metrics for at least one other series of options for said interconnected system; and

displaying, via the user interface, the financial metrics for said optimum series of options and said at least one other series of options in the form of a profit/loss comparison report, said displaying including at least a tabular format.

196. The computer-readable medium of claim 186, further including:

displaying, upon user request, a cost breakout report showing said inventory cost and said manufacturing cost for a portion of said optimum series of options, said portion corresponding to one or more of said stages selected by the user via the user interface, said displaying including at least a tabular format.

197. The computer-readable medium of claim 186, further including:

displaying, upon user request, an inventory report showing an inventory level associated with said optimum series of options, said displaying including at least a tabular format.

198. The computer-readable medium of claim 197, further including:

displaying, upon user request, an inventory by cause report showing for each said inventory level detailed analysis information, said detailed analysis information including at least one of batching, early arrivals, demand uncertainty, and stage time uncertainty, said displaying including at least a tabular format.

199. The computer-readable medium of claim 167, further including:

displaying, upon user request, said information selected and presented in a user specified arrangement in the form of an ad hoc report, said arrangement selected by the user via the user interface, said displaying including at least a tabular format.

200. The computer-readable medium of claim 167, wherein said cost is a monetary cost associated with an option.

201. The computer-readable medium of claim 167, wherein said time is an amount of time associated with an option.

202. The computer-readable medium of claim 165, wherein each of said plurality of stages represents an operation to be performed.

203. The computer-readable medium of claim 165, wherein said total costs is the summation of quantifiable characteristics, said summation of quantifiable characteristics being a function of said information.

204. The computer-readable medium of claim 203, wherein said summation of quantifiable characteristics includes at least one of a manufacturing cost, inventory cost, and time-to-market cost.

205. The computer-readable medium of claim 165, wherein said stage symbol include at least one of a first shape and a second shape, each of said shapes signifying at least one specific function to be performed at said stage.

206. The computer-readable medium of claim 205, wherein said at least one of said first and said second shapes is colored by at least one of a user defined color and a default color.

207. The computer-readable medium of claim 205, wherein said stage symbol includes at least one user defined icon.

208. The computer-readable medium of claim 207, wherein said at least one user defined icon is user selected, via the user interface, from among a plurality of existent icons.

209. The computer-readable medium of claim 165, wherein said user interface is presented by a web browser.

210. The computer-readable medium of claim 165, wherein at least one of said stages is user defined based upon commands of said user.

211. The computer-readable medium of claim 210, wherein said representing further includes:

positioning, using said user interface, each of said stage symbols within a modeling space.

212. An apparatus, comprising:

a first computer including a processor and a memory; and

a display device operatively connected to and responsive to the first computer;

wherein the processor is configured to:

represent each stage of a network of interconnected stages using a stage symbol,

interconnect each of said stage symbols with links to form a representation of the network of interconnected stages, the links being displayed via the user interface, each stage symbol being connected to at least one other stage symbol by at least one link, and

determine, based upon information associated with a plurality of options at each of said stages, an optimum series of options over a series of said stages by selecting a single option at each stage in said series of said stages that minimizes the sum of total costs over said series of said stages, wherein said total costs is a function of said information.

213. The apparatus of claim 212, wherein the processor is further configured to:

obtain said information associated with each option of a corresponding stage.

214. The apparatus of claim 213, wherein said information for each option includes at least a first cost and a second cost.

215. The apparatus of claim 214, wherein said information further includes first data.

216. The apparatus of claim 213, wherein the processor is further configured to:

display, via the user interface, said information of at least one of said stages.

217. The apparatus of claim 213, wherein the processor is further configured to:

obtain said information by retrieving said information from a database.

218. The apparatus of claim 217, wherein said information is formatted in accordance with Extensible Markup Language (XML) in said database.

219. The apparatus of claim 217, wherein said database is stored in said memory of said first computer.

220. The apparatus of claim 213, wherein the processor is further configured to obtain said information by accepting said information from a data entry device in conjunction with said user interface.

221. The apparatus of claim 217, wherein the processor is further configured to: maintain, using said database, one or more chain versions for each said network of interconnected stages.

222. The apparatus of claim 221, wherein the processor is further configured to: control user access to each said chain version according to a level of access associated with each of one or more users.

223. The apparatus of claim 224, wherein the processor is further configured to: display, via the user interface, a chain status for each said chain version indicating whether or not the chain version is available for editing.

224. The apparatus of claim 217, wherein said database is stored in a second memory of a second computer, and wherein the processor of said first computer is further configured to retrieve said information from said database by receiving said information from said second computer through a network.

225. The apparatus of claim 224, wherein said network includes at least one of a public switched telephone network, an Internet, and an Intranet.

226. The apparatus of claim 224, wherein said information of said database is accessible by a second user.

227. The apparatus of claim 226, wherein said second user is affiliated with at least one stage of the system.

228. The apparatus of claim 227, wherein said accessible information is readable by said second user.

229. The apparatus of claim 228, wherein said accessible information is modifiable by said second user, and when modified defines modified information, the accessibility of said information being determined by said first data.

230. The apparatus of claim 228, wherein only said information associated with said at least one stage is modifiable by said second user.

231. The apparatus of claim 230, wherein only at least one of said first cost, said second cost, and said third information of a corresponding option is modifiable by said second user.

232. The apparatus of claim 230, wherein the processor is further configured to obtain said information by:

receiving, through said network, said modified information transmitted from said second computer to said first computer; and

replacing, in said database, said information associated with a stage with said modified information.

233. The apparatus of claim 214, wherein said interconnected stages is a supply chain; each of said plurality of stages represents an operation to be performed; said first cost is a monetary amount associated with performing said operation; and said second cost is an amount of time associated with performing said operation.

234. The apparatus of claim 233, wherein said total cost includes at least one of a manufacturing cost, an inventory cost, and a time-to-market cost.

235. The apparatus of claim 234, wherein the processor is further configured to:

display, via the user interface, a portion of said optimum series of options.

236. The apparatus of claim 235, wherein a portion of said optimum series of options includes at least one of a total of said manufacturing cost, said inventory cost, and said time-to-market cost for a user selected stage of the system.

237. The apparatus of claim 212, wherein said series of said stages includes at least one user selected stage of the system, wherein said user selects, via the user interface, at least one specific stage to be included in the system when determining said optimum series of options.

238. The apparatus of claim 212, wherein said series of said stages includes all stages of the system.

239. The apparatus of claim 212, wherein said optimal series of options includes a user selected option at a corresponding stage, said user selected option being selected by the user via the user interface.

240. The apparatus of claim 235, wherein the processor is further configured to:

generate, upon a user request, a comparison report showing said total costs for all stages for said optimum series of options and total costs for another series of options, said another series of options including a user selected option at a corresponding stage, said user selected option being selected by the user via the user interface.

241. The apparatus of claim 214, wherein the processor is further configured to:

accept, via the user interface, an input of a range for at least one of said first cost and said second cost for at least one of said options, and

display the totals costs for said optimum series of options as a function of said range, wherein said display includes at least one of a tabular format and a graphical format.

242. The apparatus of claim 214, wherein the processor is further configured to:

calculate, upon user request, financial metrics for said optimum series of options for said interconnected system;

calculate, upon user request, said financial metrics for at least one other series of options for said interconnected system; and

display, via the user interface, the financial metrics for said optimum series of options and said at least one other series of options in the form of a profit/loss comparison report, said display including at least a tabular format.

243. The apparatus of claim 233, wherein the processor is further configured to:

display, upon user request, a cost breakout report showing said inventory cost and said manufacturing cost for a portion of said optimum series of options, said portion corresponding to one or more of said stages selected by the user via the user interface, said display including at least a tabular format.

244. The apparatus of claim 233, wherein the processor is further configured to:

display, upon user request, an inventory report showing an inventory level associated with said optimum series of options, said display including at least a tabular format.

245. The apparatus of claim 244, wherein the processor is further configured to:

display, upon user request, an inventory by cause report showing for each said inventory level detailed analysis information, said detailed analysis information including at least one of batching, early arrivals, demand

uncertainty, and stage time uncertainty, said display including at least a tabular format.

246. The apparatus of claim 214, wherein the processor is further configured to:

display, upon user request, said information selected and presented in a user specified arrangement in the form of an ad hoc report, said arrangement selected by the user via the user interface, said display including at least a tabular format.

247. The apparatus of claim 214, wherein said cost is a monetary cost associated with an option.

248. The apparatus of claim 214, wherein said time is an amount of time associated with an option.

249. The apparatus of claim 212, wherein each of said plurality of stages represents an operation to be performed.

250. The apparatus of claim 212, wherein said total costs is the summation of quantifiable characteristics, said summation of quantifiable characteristics being a function of said information.

251. The apparatus of claim 250, wherein said summation of quantifiable characteristics includes at least one of a manufacturing cost, inventory cost, and time-to-market cost.

252. The apparatus of claim 212, wherein said stage symbol include at least one of a first shape and a second shape, each of said shapes signifying at least one specific function to be performed at said stage.

253. The apparatus of claim 252, wherein said at least one of said first and said second shapes is colored by at least one of a user defined color and a default color.

254. The apparatus of claim 252, wherein said stage symbol includes at least one user defined icon.

255. The apparatus of claim 254, wherein said at least one user defined icon is user selected, via the user interface, from among a plurality of existent icons.

256. The apparatus of claim 212, wherein said user interface is presented by a web browser.

257. The apparatus of claim 212, wherein at least one of said stages is user defined based upon commands of said user.

258. The apparatus of claim 257, wherein said visual presentation display further includes a chain modeling space.

259. A method, comprising:

receiving information corresponding to each of a plurality of components used in a product, said information including first data and second data, wherein said first data is a quantifiable attribute of interest and said second data is an availability of each component in each of a plurality of time periods;

determining, based upon said information, corresponding functionality requirements that each component must provide over each of a series of said

periods that the corresponding component is incorporated into said product; and

determining the optimal set of components to be used in said product over a series of said periods that minimizes a cost functional subject to satisfying at least one of said second data and said functionality requirements over said series of said periods, wherein said cost functional includes the sum of at least one of a development costs and a manufacturing costs of said product over said series of said periods.

260. The method of claim 259, wherein at least one of said functionality requirements is that a performance level value of a component must be at least a performance requirement value of said component in each period, wherein

said performance level value being an index value corresponding to each component in each of said periods, said index value being a function of said second data;

said performance requirement value being a desired index value for each component in each of said periods.

261. The method of claim 260, wherein determining said functionality requirements includes determining said performance requirement value and said performance level value for each component in each period.

262. The method of claim 261, wherein determining said performance level value is determined from a first predefined function, said first predefined function being a function of said second data.

263. The method of claim 261, wherein the performance requirement value is determined from a second predefined function.

264. The method of claim 263, wherein said second predefined function is a function of a random variable.

265. The method of claim 263, wherein said second predefined function is deterministic.

266. The method of claim 260, wherein said manufacturing costs is a product of a first quantity, a second quantity, and a third quantity, wherein

said first quantity is a discount rate of each component in each period,

said second quantity is an initial unit cost of each component in each period,

said third quantity is the number of components incorporated into said product in each period.

267. The method of claim 266, wherein said number of components used in each period is a difference between a fourth quantity and a fifth quantity, wherein

said fourth quantity is a demand for each component in each period; and

said fifth quantity is a quantity of recycled components available to satisfy said demand in each period.

268. The method of claim 267, wherein said demand for each component in each period is a predefined, deterministic value.

269. The method of claim 267, wherein the said number of recycled components available to satisfy said demand is the summation of the product of the number of components used in a given period and said demand for a given period.

270. the method of claim 266, wherein said discount rate is the sum of time dependent discounts and volume dependent discounts.

271. the method of claim 270, wherein said time dependent discounts is the product of the number of periods a component is used and a time-dependent discount value, the time-dependent discount value being a price reduction received in each period the component is produced.

272. the method of claim 270, wherein said volume dependent discounts is the product of a cumulative production of a component up to a given period, a volume-dependent discount for each component, and a volume discount step for each component.

273. The method of claim 272, wherein said cumulative production up to a given period is the demand of a preceding period minus the number of recycled components used in the preceding period plus a cumulative production of a preceding period.

274. The method of claim 270, wherein each of said time-dependent discount, said volume-dependent discount, and said volume discount step size are component specific, predefined constants in each period.

275. The method of claim 266, wherein said initial unit cost of each component in each period includes at least one of the cost to transform raw material into a completed component and the procurement of the raw material.

276. The method of claim 267, wherein said cost functional further includes a remanufacturing cost, the remanufacturing cost being the product of

a cost of remanufacturing a recycled component and said quantity of recycled components.

277. The method of claim 260, further comprising:

proceeding in sequential order from the last period N of said series of periods to the first period 1 of said series of periods, and at each period:

determining said cost functional at each period to define given period costs;

determining said cost functional at each period from said given period to the last period for each of said components to define feasible period costs; and

minimizing the sum of said given period costs and said feasible period costs over said series of periods subject to satisfying said second data and said functionality requirements over said series of said periods.

278. The method of claim 260, wherein said cost functional further includes a per period penalty cost, said per period penalty cost being a cost incurred when said performance level value in a given period for a given component deviates from the performance requirement value in the given period for the given component.

279. The method of claim 278, further comprising:

proceeding in sequential order from the last period N of said series of periods to the first period 1 of said series of periods, and at each period:

determining said cost functional for each of said components at each period to define second feasible period costs;

minimizing said second feasible period costs over said series of periods subject to satisfying said second data over said series of said periods.

280. The method of claim 278, wherein said per period penalty cost is the square of the difference between said performance level value in a given period for a given component and said performance requirement value in the given for the given component, multiplied by a period dependent constant.

281. The method of claim 259, wherein said development cost is the cost incurred as result of using a component in a given period that differs from a corresponding component used in the previous period.

282. The method of claim 259, wherein said series of said periods includes all of said plurality of periods.

283. A computer-readable medium encoded with a program for a computer, the program comprising:

receiving information corresponding to each of a plurality of components used in a product, said information including first data and second data, wherein said first data is a quantifiable attribute of interest and said second data is an availability of each component in each of a plurality of time periods;

determining, based upon said information, corresponding functionality requirements that each component must provide over each of a series of said periods that the corresponding component is incorporated into said product; and

determining the optimal set of components to be used in said product over a series of said periods that minimizes a cost functional subject to satisfying at least one of said second data and said functionality requirements

over said series of said periods, wherein said cost functional includes the sum of at least one of a development costs and a manufacturing costs of said product over said series of said periods.

284. The computer-readable medium of claim 283, wherein at least one of said functionality requirements is that a performance level value of a component must be at least a performance requirement value of said component in each period, wherein

said performance level value being an index value corresponding to each component in each of said periods, said index value being a function of said second data;

said performance requirement value being a desired index value for each component in each of said periods.

285. The computer-readable medium of claim 284, wherein determining said functionality requirements includes determining said performance requirement value and said performance level value for each component in each period.

286. The computer-readable medium of claim 285, wherein determining said performance level value is determined from a first predefined function, said first predefined function being a function of said second data.

287. The computer-readable medium of claim 285, wherein the performance requirement value is determined from a second predefined function.

288. The computer-readable medium of claim 287, wherein said second predefined function is a function of a random variable.

289. The computer-readable medium of claim 287, wherein said second predefined function is deterministic.

290. The computer-readable medium of claim 284, wherein said manufacturing costs is a product of a first quantity, a second quantity, and a third quantity, wherein

said first quantity is a discount rate of each component in each period,

said second quantity is an initial unit cost of each component in each period,

said third quantity is the number of components incorporated into said product in each period.

291. The computer-readable medium of claim 290, wherein said number of components used in each period is a difference between a fourth quantity and a fifth quantity, wherein

said fourth quantity is a demand for each component in each period; and

said fifth quantity is a quantity of recycled components available to satisfy said demand in each period.

292. The computer-readable medium of claim 291, wherein said demand for each component in each period is a predefined, deterministic value.

293. The computer-readable medium of claim 291, wherein the said number of recycled components available to satisfy said demand is the summation of the product of the number of components used in a given period and said demand for a given period.

294. The computer-readable medium of claim 290, wherein said discount rate is the sum of time dependent discounts and volume dependent discounts.

295. The computer-readable medium of claim 294, wherein said time dependent discounts is the product of the number of periods a component is used and a time-dependent discount value, the time-dependent discount value being a price reduction received in each period the component is produced.

296. The computer-readable medium of claim 294, wherein said volume dependent discounts is the product of a cumulative production of a component up to a given period, a volume-dependent discount for each component, and a volume discount step for each component.

297. The computer-readable medium of claim 296, wherein said cumulative production up to a given period is the demand of a preceding period minus the number of recycled components used in the preceding period plus a cumulative production of a preceding period.

298. The computer-readable medium of claim 294, wherein each of said time-dependent discount, said volume-dependent discount, and said volume discount step size are component specific, predefined constants in each period.

299. The computer-readable medium of claim 290, wherein said initial unit cost of each component in each period includes at least one of the cost to transform raw material into a completed component and the procurement of the raw material.

300. The computer-readable medium of claim 291, wherein said cost functional further includes a remanufacturing cost, the remanufacturing cost being the product of a cost of remanufacturing a recycled component and said quantity of recycled components.

301. The computer-readable medium of claim 284, further comprising:

proceeding in sequential order from the last period N of said series of periods to the first period 1 of said series of periods, and at each period:

determining said cost functional at each period to define given period costs;

determining said cost functional at each period from said given period to the last period for each of said components to define feasible period costs; and

minimizing the sum of said given period costs and said feasible period costs over said series of periods subject to satisfying said second data and said functionality requirements over said series of said periods.

302. The computer-readable medium of claim 284, wherein said cost functional further includes a per period penalty cost, said per period penalty cost being a cost incurred when said performance level value in a given period for a given component deviates from the performance requirement value in the given period for the given component.

303. The computer-readable medium of claim 302, further comprising:

proceeding in sequential order from the last period N of said series of periods to the first period 1 of said series of periods, and at each period:

determining said cost functional for each of said components at each period to define second feasible period costs; and

minimizing said second feasible period costs over said series of periods subject to satisfying said second data over said series of said periods.

304. The computer-readable medium of claim 302, wherein said per period penalty cost is the square of the difference between said performance level value in a given period for a given component and said performance requirement value in the given for the given component, multiplied by a period dependent constant.

305. The computer-readable medium of claim 283, wherein said development cost is the cost incurred as result of using a component in a given period that differs from a corresponding component used in the previous period.

306. The computer-readable medium of claim 283, wherein said series of said periods includes all of said plurality of periods.

307. An apparatus, comprising:

a computer including a receiving portion and a processing portion, said receiving portion configured to receive information corresponding to each of a plurality of components used in a product, said information including first data and second data, wherein said first data is a quantifiable attribute of interest and said second data is an availability of each component in each of a plurality of time periods;

said processing portion being configured to determine, based upon said information, corresponding functionality requirements that each component must provide over each of a series of said periods that the corresponding component is incorporated into said product; and

said processing portion being configured to determine the optimal set of components to be used in said product over a series of said periods that minimizes a cost functional subject to satisfying at least one of said second data and said functionality requirements over said series of said periods, wherein said cost functional includes the sum of at least one of a development costs and a manufacturing costs of said product over said series of said periods.

308. The apparatus of claim 307, wherein at least one of said functionality requirements is that a performance level value of a component must be at least a performance requirement value of said component in each period, wherein

said performance level value being an index value corresponding to each component in each of said periods, said index value being a function of said second data;

said performance requirement value being a desired index value for each component in each of said periods.

309. The apparatus of claim 308, wherein determining said functionality requirements includes said processing portion being configured to determine said performance requirement value and said performance level value for each component in each period.

310. The apparatus of claim 309, wherein said processing portion is configured determine said performance level value from a first predefined function, said first predefined function being a function of said second data.

311. The apparatus of claim 309, wherein the processing portion is configured to determine the performance requirement value is from a second predefined function.

312. The apparatus of claim 311, wherein said second predefined function is a function of a random variable.

313. The apparatus of claim 311, wherein said second predefined function is deterministic.

314. The apparatus of claim 308, wherein said manufacturing costs includes a product of a first quantity, a second quantity, and a third quantity, wherein

said first quantity is a discount rate of each component in each period,

said second quantity is an initial unit cost of each component in each period,

said third quantity is the number of components incorporated into said product in each period.

315. The apparatus of claim 314, wherein said number of components used in each period is a difference between a fourth quantity and a fifth quantity, wherein

said fourth quantity is a demand for each component in each period; and

said fifth quantity is a quantity of recycled components available to satisfy said demand in each period.

316. The apparatus of claim 315, wherein said demand for each component in each period is a predefined, deterministic value.

317. The apparatus of claim 315, wherein the said number of recycled components available to satisfy said demand is the summation of the product of the number of components used in a given period and said demand for a given period.

318. The apparatus of claim 314, wherein said discount rate is the sum of time dependent discounts and volume dependent discounts.

319. The apparatus of claim 318, wherein said time dependent discounts is the product of the number of periods a component is used and a time-dependent discount value, the time-dependent discount value being a price reduction received in each period the component is produced.

320. The apparatus of claim 318, wherein said volume dependent discounts is the product of a cumulative production of a component up to a given period, a volume-dependent discount for each component, and a volume discount step for each component.

321. The apparatus of claim 320, wherein said cumulative production up to a given period is the demand of a preceding period minus the number of recycled components used in the preceding period plus a cumulative production of a preceding period.

322. The apparatus of claim 318, wherein each of said time-dependent discount, said volume-dependent discount, and said volume discount step size are component specific, predefined constants in each period.

323. The apparatus of claim 314, wherein said initial unit cost of each component in each period includes at least one of the cost to transform raw material into a completed component and the procurement of the raw material.

324. The apparatus of claim 315, wherein said cost functional further includes a remanufacturing cost, the remanufacturing cost being the product of a cost of remanufacturing a recycled component and said quantity of recycled components.

325. The apparatus of claim 308, further comprising:

the processing portion being configured to proceed in sequential order from the last period N of said series of periods to the first period 1 of said series of periods, and at each period the processing portion being configured to:

determine said cost functional at each period to define given period costs;

determine said cost functional at each period from said given period to the last period for each of said components to define feasible period costs; and

minimize the sum of said given period costs and said feasible period costs over said series of periods subject to satisfying said second data and said functionality requirements over said series of said periods.

326. The apparatus of claim 308, wherein said cost functional further includes a per period penalty cost, said per period penalty cost being a cost incurred when said performance level value in a given period for a given component deviates from the performance requirement value in the given period for the given component.

327. The apparatus of claim 326, further comprising:

the processing portion being configured to proceed in sequential order from the last period N of said series of periods to the first period 1 of said series of periods, and at each period the processing portion being configured to:

determine said cost functional for each of said components at each period to define second feasible period costs;

minimize said second feasible period costs over said series of periods subject to satisfying said second data over said series of said periods.

328. The apparatus of claim 326, wherein said per period penalty cost is the square of the difference between said performance level value in a given period for a given component and said performance requirement value in the given for the given component, multiplied by a period dependent constant.

329. The apparatus of claim 307, wherein said development cost is the cost incurred as result of using a component in a given period that differs from a corresponding component used in the previous period.

330. The apparatus of claim 307, wherein said series of said periods includes all of said plurality of periods.